MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

INTRODUCTIONS TO 3-D COORDINATE GEOMETRY

Others

1. If $A(-2, 2, 3) and B(13, -3, 13)$ are two points. Find the locus of a point P which moves in such a way that $3PA = 2PB$.

Watch Video Solution

2. Find the coordinates of the point which divides the joint of $P(2, -1, 4) and q(4, 3, 2)$ in the ratio 2:3 (i) internally (ii) externally.

Watch Video Solution

3. Show that the plane $ax + by + cz + d = 0$ divides the line joining the points $(x_1, y_1, z_1) and (x_2, y_2, z_2)$ in the ratio $\frac{ax_1 + by_1 + cz_1 + d}{ax_2 + by_2 + cz_2 + d}$.

Watch Video Solution

4. Find the ratio in which the line joining the points $(1, 2, 3) and (-3, 4, -5)$ is divided by the $xy - plane$. Also, find the coordinates of the point of division.

Watch Video Solution

5. The mid-points of the sides of a triangle are $(1, 5, -1), (0, 4, -2) and (2, 3, 4)$. Find its vertices.

Watch Video Solution

6. Find the distance between the points $P\ (1, 3, 4)$ and $Q\ (4, 1, 2)$.

Watch Video Solution

7. Prove by using distance formula that the points $P(1, 2, 3), Q(-1, -1, -1) and R(3, 5, 7)$ are collinear.

Watch Video Solution

8. Determine the point in $XY - plane$ whcih is equidistant from three points $A(2, 0, 3), B(0, 3, 2) and C(0, 0, 1)$.

Watch Video Solution

9. Show that the points $A(0, 1, 2), B(2, -1, 3) and C(1, -3, 1)$ are vertices of an isosceles right-angled triangle.

Watch Video Solution

10. Find the coordinates of a point equidistant from th four points $O(0, 0, 0), A(a, 0, 0), B(0, b, 0) and C(0, 0, c)$.

Watch Video Solution

11. Find the point on y-axis which is equidistant from the points $(3, 1, 2)\ and\ (5, 5, 2)$.

Watch Video Solution

12. Prove that the triangle formed by joining the three points whose coordinates ere $(1, 2, 3), (2, 3, 1) and (3, 1, 2)$ is an equilateral triangle.

Watch Video Solution

13. Prove that the lines joining the vertices of a tetrahedron to the centroids of opposite faces are concurrent.

Watch Video Solution

14. Using the section formula, prove that the three points $A(-2, 3, 5)$, $B(1, 2, 3)$ and $C(7, 0, -1)$ are collinear.

Watch Video Solution

15. Find the coordinates of the points which trisect the line segment AB, given that $A(2, 1, -3)$ and $B(5, -8, 3)$

Watch Video Solution

16. Find the ratio in which the join the $A(2, 1, 5) and B(3, 4, 3)$ is divided by the plane $2x + 2y - 2z = 1$. Also, find the coordinates of the point of division.

Watch Video Solution

17. Planes are drawn parallel to the coordinate planes through the point $P(x_1, y_1, z_1)$ and $Q(x_2, y_2, z_2)$. Find the length of the edges of the parallelopiped so formed.

Watch Video Solution

18. Name the octants in which the following points lie: (5,2,3)

Watch Video Solution

19. Name the octants in which the following points lie: (-5,-4,7)

Watch Video Solution

20. Name the octants in which the following points lie: (-5,4,3)

Watch Video Solution

21. Name the octants in which the following points lie: (-5,-3,-2)

Watch Video Solution

22. Name the octants in which the following points lie: (4,-3,5)

Watch Video Solution

23. Name the octants in which the following points lie: (2,-5,-7)

Watch Video Solution

24. Name the octants in which the following points lie: (7,4,-3)

Watch Video Solution

25. Name the octants in which the following points lie: (-7,2,-5)

Watch Video Solution

26. Find the image of: (-2,3,4) in the yz-planes.

Watch Video Solution

27. Find the image of: 5,2,-7) in the xy-planes.

Watch Video Solution

28. Find the image of: (-4,0,0) in the xy-planes.

Watch Video Solution

Watch Video Solution

29. Find the image of: (-5,4,-3) in the xz-planes.

Watch Video Solution

30. Find the image of point: (-5,0,3) in the xz-planes.

Watch Video Solution

31. A cube of side 5 has one vertex at the point (1,0,1) and the three edges from this vertex are respectively, parallel to the negative $x \, and \, y$ axes and positive z axis. Find the coordinates of the other vertices of the cube.

Watch Video Solution

32. Planes are drawn parallel to the coordinate planes through the points (3,0,-1) and (-2,5,4). Find the lengths of the edges of he parallelepiped so formed.

Watch Video Solution

33. Planes are drawn through the points (5,0,2) and(3,2,-5) parallel to the coordinate planes find the lengths of the edges of the rectangular prallelopiped so formed.

Watch Video Solution

34. Find the distances of the point $P(-4, 3, 5)$ from the coordinate axes.

Watch Video Solution

35. The coordinates of a point are (3,-2,5). Write down the coordinates of seven points such that the absolute values of their coordinates are the same as those of the coordinates of the given point.

Watch Video Solution

36. Find the locus of the point which is equidistant from the points $A(0, 2, 3) and\ B(2, -2, 1)$.

Watch Video Solution

37. Find the distance between the following pairs of point: P(1,-1,0) and Q(2,1,2)

Watch Video Solution

38. Find the distance between the following pairs of point: $Q(3, 2, -1) and\ B(-1, 1, -1)$.

Watch Video Solution

39. Find the distance between the points $P\ and\ Q$ having coordinates (-2,3,1) and (2,1,2).

Watch Video Solution

40. Using distance formula prove that the following points are collinear:

$A(4, -3, -1),\ B(5, -7, 6) and\ C(3, 1, -8)$

Watch Video Solution

41. Using distance formula prove that the following points are collinear:

$P(0, 7, -7),\ Q(1, 4, -5) and R(-1, 10, -9)$

Watch Video Solution

42. Using distance formula prove that the following points are collinear:

$A(3, -5, 1), B(-1, 0, 8)\ and C(7, -10, -6)$

Watch Video Solution

43. Determine the points in i. xy-plane which re equidistant from the points $A(1, -1, 0), B(2, 1, 2), and\ C(3, 2, -1)$

Watch Video Solution

44. Find the points on z-is which are t a distance $\sqrt{21}$ from the point (1,2,3).

Watch Video Solution

45. Show that the points (0,7,10), (-1,6,6) and(-4,9,6) are the vertices of an isosceles right angled triangle.

Watch Video Solution

Watch Video Solution

46. Show that the points $A(3, 3, 3,), B(0, 6, 3), C(1, 7, 7) and D(4, 4, 7)$ are the vertices of a square.

Watch Video Solution

47. Prove that the point $A(1, 3, 0), B(-5, 5, 2), C(-9, -1, 2) and D(-3, -3, 0)$ taken in order are the vertices of a parallelogram. Also, show that ABCD is not a rectangle.

Watch Video Solution

48. Show that the points $A(1, 3, 4),\ B(-1, 6, 10),\ C(-7, 4, 7) and\ D(-5, 1, 1)$ are have vertices of a rhombus.

Watch Video Solution

49. Prove that the tetrahedron with vertices at the points $O(0, 0, 0),\ A(0, 1, 1), B(1, 0, 1) and\ C(1, 1, 0)$ is a regular one.

Watch Video Solution

50. Show that the points (3,2,2), (-1,4,2), (0,5,6), (2,1,2) lie on a sphere whose centre is (1,3,4). Find the also its radius.

Watch Video Solution

Watch Video Solution

51. Find the coordinates of the point which is equidistant from the four points $O(0, 0, 0),\ A(2, 0, 0),\ B(0, 3, 0) and\ C(0, 0, 8)$.

Watch Video Solution

52. Find the locus of P if $PA^2 + PB^2 = 2k^2 where\ A\ and\ B$ are points (3,4,5) and (-1,3,7).

Watch Video Solution

53. Are the points $A(3, 6, 9),\ B(10, 20, 30) and\ C(25, -41, 5),$ the vertices of a right angled triangle?

Watch Video Solution

54. Verify the following: (0,7,-10), (1,6,-6) and (4,9,-6) are vertices of an isosceles triangle.

Watch Video Solution

55. Find out whether the points $(0, 7, 10), (-1, 6, 6)$ and $(-4, 9, 6)$ are the vertices of a right angled triangle.

Watch Video Solution

Watch Video Solution

56. Verify the following: (-1,2,1), (1,-2,5), (4,-7,8) and (2,-3,4) are vertices of a parallelogram.

Watch Video Solution

57. Verify the following: (5,-1,1),(7,-4,7), (1,-6,10) and (-1,-3,4) are the vertices of a rhombus.

Watch Video Solution

58. Find the locus of the points which are equidistant from the points (1,2,3) and (3,2,11).

Watch Video Solution

59. Find the locus of the point, the sum of whose distances from the points $A(4, 0, 0) and\ B(-4, 0, 0)$ is equal to 10.

Watch Video Solution

60. Show that the points $A(1, 2, 3),\ B(-1, -2, -1),\ C(2, 3, 2) and\ D(4, 7, 6)$ are the vertices of a parallelogram ABCD but not a rectangle.

Watch Video Solution

61. Find the equation of the set of the points P such that is distances from the points $A(3, 4, -5)$ and $B(-1, 2, 4)$ are equal.

A. $8x + y - 18z - 29 = 0$

B. $8x + 4y - 18z - 29 = 0$

C. $x + 4y - 18z - 29 = 0$

D. $8x - 4y - 18z - 29 = 0$

Answer: B

Watch Video Solution

62. Given that $P(3, 2, -4), Q(5, 4, -6)$ *and* $R(9, 8, -10)$ are collinear. Find the ratio in which Q divides PR.

Watch Video Solution

63. Three vertices of a parallelogram ABCD are $A(3, -1, 2), B(1, 2, -4) and\, C(-1, 1, 2)$. Find the coordinates of the fourth vertex.

Watch Video Solution

64. Find the lengths of the medians of the triangle with vertices $A(0, 0, 6), B(0, 4, 0) and\, C(6, 0, 0)$.

Watch Video Solution

65. Let $A(3, 2, 0), B(5, 3, 2), C(-9, 6, -3)$ be three points forming a triangle. The bisector $AD\ of\ \angle BAC$ meets sides in D. Find the coordinates of D.

Watch Video Solution

Watch Video Solution

66. If the origin is the centroid of the triangle with vertices $P(2a,\ 2, 6),\ Q(-4, 3b,\ -10) and\ R(8, 14, 2c)$, find the values of $a\ and\ b$.

Watch Video Solution

67. A point R with x-coordinates 4 lies on the line segment joining the points $P(2,\ -3, 4) and\ Q(8, 0, 10)$. Find the coordinates of the point R.

Watch Video Solution

68. Show that the coordinates off the centroid of the triangle with vertices $A(x_1, y_1, z_1),\ B(x_2, y_2, z_2) and\ (x_3, y_3, z_3)$ are $\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}, \frac{z_1+z_2+z_3}{3}\right)$

Watch Video Solution

69. Let $P\ and\ Q$ be any two points. Find the coordinates of the point R which divides PQ externally in the ratio 2:1 and verify that Q is the mid point of PR.

Watch Video Solution

70. The vertices f the triangle are $A(5, 4, 6),\ B(1, -1, 3) nad\ C(4, 3, 2)$. The internal

bisector of angle A meets BC at D. Find the coordinates of D and the length AD.

Watch Video Solution

71. A point C with z-coordinate 8 lies on the line segment joining the point $A(2, -3, 4)$ and $B(8, 0, 10)$. Find its coordinates.

Watch Video Solution

72. Show that the three points $A(2, 3, 4)$, $B(-1, 2, -3)$ and $C(-4, 1, -10)$ are collinear and find the ratio in which C divides AB.

Watch Video Solution

73. Find the ratio in which the line joining (2,4,5) and (3,5,4) is divided by the yz-plane.

Watch Video Solution

74. Find the ratio in which the line segment joining the points (2,-1,3) and (-1,2,1) is divided by the plane $x + y + z = 5$.

Watch Video Solution

75. If the points $A(3, 2, -4), B(9, 8, -10) and C(5, 4, -6)$ are collinear, find the ratio in which C divides AB.

Watch Video Solution

76. The id points of the sides of a triangle ABC are given by $(-2, 3, 5), (4, -1, 7) and (6, 5, 3)$. Find the coordinates of the angle $\angle BAC$ meets BC.

Watch Video Solution

77. Find the ratio in which the sphere $x^2 + y^2 + z^2 = 504$ divides the line joining the points (12,-4,8) and (27,-9,18).

Watch Video Solution

78. Find the centroid of a triangle, mid points of whose sides are (1,2,-3), (3,0,1) and (-1,1,-4).

A. $(1, -1, -2)$

B. $(1, 1, -2)$

C. $(-1, 1, -2)$

D. $(-1, -1, -2)$

Answer: B

Watch Video Solution

79. The centroid of a triangle ABC is at the point (1,1,1). If the coordinates of A and B are (3,-5,7) and (-1,7,-6) respectively, find the coordinates of the point C.

Watch Video Solution

80. Find the coordinates of the points which trisect the line segment joining the points $P(4, -2, -6)$ *and* $Q(10, -16, 6)$.

Watch Video Solution

81. Using section formula, show that the points $A(2, -3, 4)$, $B(-1, 2, 1)$ *and* $C\left(0, \frac{1}{3}, 2\right)$ are collinear.

Watch Video Solution

82. Given that $P(3, 2, -4), Q(5, 4, -6) and R(9, 8, -10)$ are collinear. Find the ratio in which Q divides PR.

Watch Video Solution

83. Find the ratio in which the segment joining the points (4,8,10) and (6,10,-8) is divided by the yz-plane.

Watch Video Solution

84. Write the distance of the point $P(2, 3, 5)$ from the xy-plane.

Watch Video Solution

85. Write the distance of the point $P(3, 4, 5)$ from z-axis.

Watch Video Solution

86. If the distance between the points $P(a, 2, 1) and\ Q(1, -1, 1)$ is 5 units find the value of a.

Watch Video Solution

87. The coordinates of the mid points of sides AB, BC and CA of ABC are $D(1, 2, -3)$, $E(3, 0, 1) and\ F(-1, 1, -4)$ respectively. Write the coordinates of its centroid.

Watch Video Solution

88. Write the coordinates of the foot of the perpendicular from the point (1,2,3) on y-axis.

Watch Video Solution

89. Write the length of the perpendicular drawn from the point $P(3, 5, 12)$ on x-axis.

Watch Video Solution

90. Write the coordinates of third vertex of a triangle having centroid at the origin and two vertices at (3,-5, 7) and (3,0,1).

Watch Video Solution

91. What is the locus of a point (x, y, z) for which $y = 0, z = 0$?

Watch Video Solution

92. Find the ratio in which the line segment joining the points (2,4,5) and (3,-5,4) is divide by the yz-plane.

Watch Video Solution

93. Find the point on y-axis which is at a distance of $\sqrt{10}$ units from the point(1,2,3).

Watch Video Solution

94. Find the point on x-axis which is equidistant from the points $A(3, 2, 2) and B(5, 5, 4)$.

Watch Video Solution

95. Find the coordinates of a point equidistant from the origin and pints $A(a, 0, 0),\ B(0, b, 0) and\ C(0, 0, c)$.

Watch Video Solution

96. Write the coordinates of the point P which is five sixth of the way from $A(-2, 0, 6) \rightarrow B(10, -6, -12)$.

Watch Video Solution

97. If a parallelepiped is formed by the planes drawn through the points (2,3,5) and (5,9,7) parallel to the coordinate planes, then write the lengths of edges of the parallelopiped and length of the diagonal.

Watch Video Solution

98. Determine the point on yz-plane which is equidistant from points $A(2, 0, 3),\ b(0, 3, 2) and\ C(0, 0, 1)$.

Watch Video Solution

99. If the origin is the centroid of a triangle ABC having vertices $A(a, 1, 3),\ B(-2, b, -5) and\ C(4, 7, c)$, find the values of $a, b,$.

Watch Video Solution

100. The ratio in which the line joining (2,4,5) and (3,5,-9) is divided by the yz-plane is a. 2:3 b. 3:2 c. -2:3 d. 4:3

A. $2:3$

B. $3:2$

C. $-2:3$

D. $4:3$

Answer: null

Watch Video Solution

101. The ratio in which the line joining the points (a, b, c) and $(-a, -c, -b)$ is divided by the xy-plane is

A. $a:b$

B. $b:c$

C. $c:a$

D. $c:b$

Answer: D

Watch Video Solution

102. If $P(0, 1, 2), Q(4, -2, 1) and O(0, 0, 0)$ are three points then $\angle POQ =$ a. $\frac{\pi}{6}$ b. $\frac{\pi}{4}$ c. $\frac{\pi}{3}$ d. $\frac{\pi}{2}$

Watch Video Solution

103. If the extremities of the diagonal fo a square are (1,-2,3) and (2,-3,5), then the length of the side is $\sqrt{6}$ b. $\sqrt{3}$ c. $\sqrt{5}$ d. $\sqrt{7}$

Watch Video Solution

104. The points (5,-4,2), (4,-3,1), (7,6,4) and (8,-7,5) are the vertices of a. a rectangle b. a square c. a parallelogram d. none of these

Watch Video Solution

105. In a three-dimensional xyz space, the equation $x^2 - 5x + 6 = 0$ represents

Watch Video Solution

106. Let (3,4,-1) and (-1,2,3) be the end points of diameter of a sphere. Then the radius of the sphere is equal to a. 2 b. 3 c. 6 d. 7

Watch Video Solution

107. XOZ-plane divides the join of (2,3,1) and (6,7,1) in the ratio

a. 3:7 b. 2:7 c. -3:7 d. -2:7

Watch Video Solution

108. What is the locus of a point for which $y = 0, z = 0?$ a. x-axis b. y-axis c. z-axis d. yz-plane

Watch Video Solution

109. The coordinates of the foot of the perpendicular drawn from the point $P(3, 45)on$ the yz-plane are a. (3,4,0) b. (0,7,0) c. (0,0,8) d. (0,7,8)

Watch Video Solution

110. The perpendicular distance of the point $P(6, 7, 8)$ from xy-plane is a. 8 b. 7 c. 6 d. 10

Watch Video Solution

111. The length of the perpendicular drawn from the point $P(3, 4, 5)$ on y-axis is a. $3\sqrt{2}$ b. 5 c. $\sqrt{113}$ d. $5\sqrt{2}$ e. $\sqrt{34}$

Watch Video Solution

112. The perpendicular distance of the point $P(3, 3, 4)$ from the x-axis is $3\sqrt{2}$ b. 5 c. 3 d. 4

Watch Video Solution

113. The length of the perpendicular drawn from the point $P(a, b, c)$ from z-axis is a. $\sqrt{a^2 + b^2}$ b. $\sqrt{b^2 + c^2}$ c. $\sqrt{a^2 + c^2}$ d. $\sqrt{a^2 + b^2 + c^2}$

Watch Video Solution